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EXAMINER
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 21

Application Number: 09/478,812
Filing Date: January 07, 2000
Appellant(s): SUGANO ET AL.

Ronald P. Kananen
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/27/02.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 11, 12, 17, 18, 27, 28, 39, 40, 53, 54, 63, 65, 73 and 74 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,017,779	Miyasaka	1-2000
5,798,744	Tanaka et al.	8-1998

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C.

122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 11, 39, 53, 63, and 73 stand rejected under 35 U.S.C. 102(e) as being anticipated by Miyasaka 6,017,779. Miyasaka discloses (see, for example, FIG. 1D) a thin film semiconductor device comprising an intrinsic silicon film 103, gate insulator layer 104, and gate electrode 105. In column 35, lines 45-47, Miyasaka discloses the intrinsic silicon film as having thickness of 500 A (=50 nm). In column 36, lines 18-64, Miyasaka states that the intrinsic silicon film is an a-Si films (amorphous silicon film) that is crystallized into polycrystalline silicon. In column 39, lines 12-15, Miyasaka describes the polycrystalline silicon as being uniform. Also, see ***Product-by-Process Limitations*** paragraph below.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 12, 18, 28, 40, 54, 65, and 74 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka 6,017,779 as applied to claims 11, 39, 53, 63, and 73 above, and further in view of Tanaka et al. 5,798,744. Miyasaka does not disclose the thin film transistor as part of a display device comprising a pair of substrates adhered with an electrooptical substance

and a presence of counter, pixel electrodes, etc. However, it was well known in the art at the time of invention that thin film transistors are integral to display or LCD devices (for example. see abstract and column 1, lines 8-17 of Tanaka). Therefore. it would have been obvious to one of ordinary skill in the art at time of invention to use the TFT polycrystalline films of Miyasaka's invention in thin film transistors in view of Tanaka's teaching that display devices conventionally contain thin film transistors.

a. Note, for example, in FIG. 3, Tanaka shows a display device with the two substrates 12, 10, liquid crystal 200, counter electrodes 170r, 170g, pixel electrodes 150 and thin film transistor 101. These components are conventionally found in LCD display devices.

b. Miyasaka in view of Tanaka discloses the limitations of claim 18 except for the plural units. Having plural units on a substrate permits the formation of more complicated semiconductor structures such as complementary transistors (CMOS) wherein more than one transistor is required. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to duplicate the units (and form more than one polycrystalline unit) in order to form a more robust device (i.e. CMOS), and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. In re Japikse, 86 USPQ 70.

c. The limitations of claim 28 are disclosed in the combination of Miyasaka and Tanaka except for "said semiconductor thin films are accumulated." However, accumulating thin films produces a thicker thin film with a greater current

capacity. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to duplicate and accumulate the semiconductor thin films in order to produce a thin film with greater current capacity, and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. In re Japikse, 86 USPQ 70.

5. Claim 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka 6,017,779. Miyasaka discloses the limitations of claim 17 except for the plural units. Having plural units on a substrate permits the formation of more complicated semiconductor structures such as complementary transistors (CMOS) wherein more than one transistor is required. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to duplicate the units (and form more than one polycrystalline unit) in order to form a more robust device (i.e. CMOS), and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. In re Japikse, 86 USPQ 70.

6. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka 6,017,779. The limitations of claim 27 are disclosed in Miyasaka except for "said semiconductor thin films are accumulated." However, accumulating thin films produces a thicker thin film with a greater current capacity. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to duplicate and accumulate the semiconductor thin films in order to produce a thin film with greater current capacity, and since it has been held that

mere duplication of the essential working parts of a device involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Product-by-Process Limitations

7. While not objectionable, the Office reminds Applicant that "product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. Note that applicant has the burden of proof in such cases, as the above case law makes clear. Thus, no patentable weight will be given to those process steps which do not add structural limitations to the **final** product.

All the claims recite limitations that do not offer any *structural* variation to the ***final*** product. Language, such as "formed by forming ..... irradiating ..... with an energy beam" and "irradiate said region at a time by a single shot irradiation" in claim 11, only recites methods of forming the final product and do not add any structural limitations to the final product.

(11) Response to Argument

The gist of Appellant's arguments against the anticipatory rejection is primarily based on method steps that allegedly distinguish the semiconductors from those of the prior art. However, the claimed method steps are not germane to the claims being examined in the instant application. This is because the invention, as set forth in the claims, is clearly directed to an apparatus. Therefore, the method steps for making the invention fails to structurally distinguish the claimed invention from the disclosure of Miyasaka 6,017,779.

Appellant argues on page 7, middle paragraph of the appeal brief that the method of "irradiating an amorphous semiconductor substrate with an energy beam that has an adjusted cross sectional shape so that a region of the substrate is irradiated with a single shot" will ascribe a structural feature that distinguishes from other semiconductors in the prior art. In the claims, the appellant states that this structural feature is a semiconductor thin film converted to polycrystalline silicon whose characteristics are made uniform. This structural feature (polycrystalline silicon thin film whose characteristics are made uniform) is also stated on page 14, lines 3-6 and page 34, lines 1-17 of the specification, and in the last paragraph on page 4 of the appeal brief. Miyasaka similarly discloses a polycrystalline thin film whose characteristics are made uniform. Miyasaka states (see, for example, column 39, lines 12-15) an "ideal a-Si film can be obtained by optimizing the deposition conditions for the initial a-Si layer; and uniform, high-quality poly-Si films can be obtained by crystallizing this initial a-Si layer". Therefore, whether the method steps ascribe a structural feature or not, Miyasaka discloses the same structural feature (a uniform polycrystalline film) and therefore does not structurally distinguish the claimed invention from that of Miyasaka.

In the last paragraph of page 7 of the appeal brief, the appellant argues that Miyasaka teaches a conventional process that produces borders; however, this is not persuasive due to the fact that Miyasaka also does not disclose a process that produces borders. Again, the method in which the invention is made is not an issue with respect to the rejection of the claims. However, this argument will be addressed since it is related to the structural limitations regarding the uniform characteristics of a polycrystalline thin film. Throughout the specification, Miyasaka clearly states the production of a uniform polycrystalline silicon film with no mention of the production of borders. However, in column 36, lines 28-48, Miyasaka does disclose a laser irradiation providing the means for **uniformly** crystallizing the a-Si (amorphous silicon) to form poly-Si (polycrystalline) over the entire substrate. Therefore, it is quite clear that Miyasaka is disclosing a uniform polycrystalline thin film, and not a polycrystalline film with borders.

It should also be noted that the appellant's claims do not specifically state a polycrystalline film without borders but only a polycrystalline thin film whose characteristics are uniform.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted.

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April 7, 2003

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